

# COVID-19 survivors: Women regained their ability to breathe, but did they regain their ability to make love?

Original  
Article

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## ABSTRACT

**Background:** Lately, the widespread outbreak of the coronavirus disease known as COVID-19 has been responsible for considerable economic and social devastation.

**Aim:** The current study aimed to assess the effect of COVID-19 on sexual function in a sample of sexually active married Egyptian women.

**Patients and Methods:** April 2021 to August 2021, 300 sexually active married women who attended the outpatient clinics at Benha University Hospital voluntarily participated in a survey to gather information regarding their sexual health. Of these, 150 had previously been infected with COVID-19, and 150 were healthy women with neither close contact with an infected family member nor a history of COVID-19. This study used two indices Arabic validated form of the female sexual functioning index (FSFI) and the Arabic-validated form of depression, anxiety, and stress score (Depression Anxiety Stress Scales; DASS).

**Results:** In the present study, mean desire, arousal, lubrication, orgasm, satisfaction levels as well as FSFI-6 total score showed a significant gradual decrease between healthy and previously infected subjects, respectively ( $P < 0.001$  for each). However, pain frequency did not differ significantly among the studied groups. FSFI showed significant negative correlations with age, children number, and age of youngest. Mean depression, anxiety, stress, and DASS significantly increased in healthy and infected subjects, respectively ( $P < 0.001$  for each). DASS showed a significant negative correlation with FSFI.

**Conclusion:** The present findings suggested that COVID-19 negatively impacted all female sexual functions and increased depression, anxiety, and stress among most participants. These two indices (sexuality and psychological state) affect one another, and COVID-19 increases these affections. Most women recovered their capacity to breathe adequately after COVID-19 but did not recover their sexual abilities properly.

**Key Words:** Anxiety, COVID-19, DASS, female sexual desire, FSFI

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## INTRODUCTION

Sexuality is an important part of women's life and a major factor in their psychological well-being. Enjoying one's sex life, releasing sexual tension, and exhibiting emotional connection are a few advantages. Several internal and external factors influence human sexuality, including anatomy, neurotransmitters, and emotions<sup>[1]</sup>.

As a result of stimulation by unique signals, starting arousal gives rise to the emotional-motivational reaction known as sexual desire<sup>[2]</sup>. Several physiological, psychological, and sociological factors can influence sexual desire. Couple issues and interpersonal factors can contribute to sexual dysfunction<sup>[3]</sup>.

One of the two sexual desire disorders described in the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM5) is Hypoactive Sexual Desire Disorder (HSDD)<sup>[4]</sup>. In the DSM-5, HSDD was split into male HSDD and female sexual interest/arousal disorder<sup>[5]</sup>. The previous categories of hypo-active female sexual desire disorder and female sexual arousal disorder were merged into the single diagnosis of female sexual interest/arousal disorder. Dyspareunia and vaginismus were also merged into a single diagnosis of genito-pelvic pain/penetration disorder. Sexual aversion disorder was eliminated completely<sup>[6]</sup>.

Female sexual functioning is typically measured using the Female Sexual Function Index (FSFI), widely recognized as a reliable and valid assessment that evaluates

several facets of sexuality<sup>[7]</sup>.

The coronavirus disease was traditionally disregarded as an infectious condition that could impact psychological health. The World Health Organization declared coronavirus illness (COVID-19) a pandemic, and it has recently taken over people's lifestyles. Time moves extremely differently in the isolation and routine of daily existence. In addition, concurrent stress and worry may cause mood changes, depression, or reduced sexual desire. On the other hand, many couples can spend much more time together than they would otherwise because of the rise of remote employment. Consequently, it appears that the effects of COVID-19 are pertinent to sexual health<sup>[8]</sup>.

This study aimed to determine the impact of COVID-19 on sexual function among a sample of sexually active married Egyptian women.

## PATIENTS AND METHODS

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### Study population

This study was conducted between April and August of 2021 on 300 sexually active married women attending outpatient clinics at Benha University Hospitals. According to COVID-19 infection, the participants in this research were classified into two groups. Group 1 comprised 150 women who had previously been infected with COVID-19 and had successfully recovered. While group 2 contained 150 healthy females with no recent close contact with an infected close relative and no prior history of COVID-19 infection during the previous 4 months.

This study was started after approval of the protocol by the Ethical Committee of Benha University, Faculty of Medicine, and the Department of Dermatology, Andrology, and Venereology (MS-13-2-2021). Each participant received a complete review of the nature and purpose of the study, and informed consent was taken from each participant according to the human rights and Ethical Committee.

We included married women with regular sexual relations. We excluded women with no regular sexual activity from this study and women with any previously diagnosed medical or psychological diseases impairing sexual relations.

The FSFI questionnaire<sup>[9]</sup> was used in the current study. A validated Arabic version of this questionnaire was used<sup>[10]</sup>. Desire, arousal, lubrication, orgasm, satisfaction,

and pain are the six domains comprising the FSFI-6. The ratings for the desire and satisfaction questions range from 1 to 5, while the ratings for the other items range from 0 to 5 on a 6-point Likert scale. Total scores vary from 2 to 36; lower values denote poorer sexual function.

The Depression Anxiety Stress Scales (DASS) have been developed to evaluate three types of emotional suffering<sup>[11]</sup>. A validated Arabic version of DASS21 was used in the current study<sup>[12]</sup>. The DASS-21 is a self-report scale with 21 items that aims to estimate the population's stress, anxiety, and depression levels. There are four response alternatives for each of the seven items, ranging from 0 (did not apply to me at all) to 3 (applied to me much, or most of the time)<sup>[11]</sup>.

### Statistical analysis

The collected data was revised, coded, and tabulated in statistical analysis using the Statistical Package for Social Science (IBM Corp., Released in 2017). Kolmogorov Smirnov test was done to test the normality of data distribution. Descriptive statistics include mean, standard deviation ( $\pm$ SD) for parametric numerical data, median and range for nonparametric data, and frequency and percentage of non-numerical data. Analytical statistics include the  $\chi^2$  test, Fisher exact test, one-way analysis of variance), and the Kruskal-Wallis test.

Correlation analysis assessed the strength of the association between two quantitative variables. The correlation coefficient defines the strength and direction of the linear relationship between two variables. A P value is considered significant if less than or equal to 0.05 at a confidence interval of 95%.

## RESULTS

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A total of 300 sexually active married women participated in the present investigation. Despite the individuals' ages being classified into five groups every decade from 18 to 52, there were no discernible differences between the groups. There was no substantial difference in education levels between the studied groups.

The FSFI was estimated for desire, arousal, lubrication, orgasm, satisfaction, pain, and total score. Mean desire, arousal, lubrication, orgasm, satisfaction levels, and FSFI-6 total score showed a significant gradual decrease between healthy and previously infected subjects, respectively ( $P < 0.001$  for each). However, pain frequency did not differ significantly among the studied groups (Table 1).

**Table 1:** Comparison of the FSFI components and total score in the studied groups

	No infection or close contact, N=150	Infection, N=150	<i>P</i>
1. Desire: level			
Mean	4.4	2.8	<0.001
SD	0.6	0.8	
2. Arousal: level			
Mean	4.6	2.9	<0.001
SD	0.6	1.1	
3. Lubrication: frequency			
Mean	5.2	3.3	<0.001
SD	0.6	1.2	
4. Orgasm: frequency			
Mean	5	3.3	<0.001
SD	0.5	1.3	
5. Satisfaction: with overall sex life			
Mean	5.2	3.2	<0.001
SD	0.7	1.3	
6. Pain: frequency during vaginal penetration			
Mean	3.4	3.3	0.296
SD	0.3	0.9	
FSFI-6 total score			
Mean	27.8	18.8	<0.001
SD	2.6	6.1	

FSFI, Female Sexual Function Index.

The current findings demonstrated reduced sexual desire (36.3%) and sexual arousal (36.9%) between the healthy and previously infected groups. In the present study, a decline was noticed in female satisfaction (38.4%) between the healthy and previously infected groups. And also, the orgasm score showed a decrease of 34% between previously healthy and previously infected groups. The total FSFI-6 score showed a reduction of 32.4% between the healthy group and the previously infected group.

The FSFI showed significant negative correlations with

age ( $r's=0.276$ ,  $P<0.001$ ), children's number ( $r's<0.129$ ,  $P=0.006$ ), and the age of the youngest ( $r's=-0.104$ ,  $P=0.027$ ). FSFI did not show significant correlations with the education level ( $r's=0.022$ ,  $P=0.639$ ) or the duration from acquiring the infection ( $r's=-0.004$ ,  $P=0.930$ ).

The DASS was calculated for depression, anxiety, stress, and total score. Mean depression, anxiety, stress, and DASS showed a significant gradual increase between the healthy and previously infected subjects, respectively ( $P<0.001$  for each) (Table 2).

**Table 2:** Comparison of the DASS components and total score in the studied groups

	No infection or close contact, N=150	Infection, N=150	P
Depression			
Mean	2.1	12.3	<0.001
SD	1.8	5.3	
Anxiety			
Mean	3.0	12.8	<0.001
SD	1.9	5.2	
Stress			
Mean	1.9	12.1	<0.001
SD	1.7	4.9	
DASS			
Mean	6.9	37.0	<0.001
SD	4.7	15.0	

DASS, Depression Anxiety Stress Scales.

Among all studied participants, depression score was assessed; 52.3% were normal, 5% were mild, 6% were moderate, 12% were severe, and 24.7% had extremely severe depression. The healthy control group was significantly associated with normal depressive scores ( $P < 0.001$ ). Severe and extremely severe scores were significantly related to the previous infection group ( $P < 0.001$ ). Dysfunction FSFI score was significantly associated with an extremely severe depressive score ( $P < 0.001$ ).

Among all studied participants, the anxiety score was assessed; accordingly, 40% were normal, 12.3% were mild, 4.7% had moderate, 3% had severe, and 40% had extremely severe anxiety. The healthy control group was significantly associated with normal and mild anxiety scores ( $P < 0.001$ ). Severe and extremely severe anxiety scores were significantly associated with a previously infected group ( $P = 0.016$ ,  $< 0.001$ , respectively). Dysfunction FSFI score was significantly associated with an extremely severe anxiety score ( $P < 0.001$ ).

Among all studied participants, stress score was assessed; accordingly, 59% were normal, 3.3% were mild, 8.3% were moderate, 22.4% were severe, and 7% had extremely severe stress scores. The healthy control group was significantly associated with normal stress scores ( $< 0.001$  for each). Severe and extremely severe anxiety scores were significantly associated with the previously infected group ( $< 0.001$  for each). Dysfunction FSFI score was significantly associated with extremely severe stress ( $P < 0.001$ ).

The DASS showed a significant negative correlation with FSFI ( $r = -0.839$ ,  $P < 0.001$ ).

## DISCUSSION

Women frequently experience sexual issues, but when such problems lead to distress rather than a normal physiological reaction because of challenging circumstances, these problems become dysfunctional<sup>[13]</sup>. In international surveys, at least one-third of women reported decreased sexual desire, making it the most frequent sexual complaint among women<sup>[14]</sup>.

Globally, the COVID-19 pandemic dramatically influenced people's general health<sup>[15]</sup>. The spread of COVID-19 and the subsequent isolation had unprecedented, dramatic effects on people's economic and political security as well as their mental and interpersonal health<sup>[16]</sup>.

The current study aimed to evaluate how COVID-19 affected the desire for sex in 300 sexually active, healthy married women.

In the current study, mean desire, arousal, lubrication, orgasm, satisfaction levels, and FSFI-6 total score showed significant differences between healthy and previously infected subjects, respectively ( $P < 0.001$  for each). However, pain frequency did not differ significantly among the studied groups. The current findings demonstrated a reduction in sexual desire (36.3%) and sexual arousal (36.9%) between healthy and previously infected groups.

These results were in line with those of Li *et al.*<sup>[17]</sup>, who showed a reduction in female satisfaction in the COVID era by 39%. The current study also supported Karsiyakali *et al.*<sup>[18]</sup>, who claimed that the number of weekly sexual encounters decreased by 40.8% and that participants' sexual desire decreased by 31.5% during the COVID-19 outbreak.

This negative impact illustrates the significant effect of the lockdown on sexual health for at least three reasons. First, the stress of being in quarantine, then the worry that sexual activity would spread COVID-19, and finally, the psychological effects of COVID-19 (depression, anxiety, and stress) and how these significantly affect sexuality. Lower levels of sexual inclination can result from negative emotional feelings<sup>[19]</sup>.

In contrast, Yuksel and Ozgor<sup>[20]</sup> observed an increase in sexual desire and sexual intercourse frequency among women during the COVID-19 outbreak, contradicting the current study's conclusion about a decline in sexual desire and frequency. This disagreement may be explained by the fact that female sexual function is negatively impacted by urine incontinence and that treating urinary incontinence can enhance sexual function<sup>[21]</sup>.

Additionally, a different study by Arafat *et al.*<sup>[22]</sup> opposed the current findings and found no appreciable difference in sexual behavior before and during the lockdown. The majority of participants engaged in sexual activity once to five times a week before and throughout the lockdown (76% and 72%, respectively). In contrast, the data indicate that more participants had more than five times a week of sexual activity with their partner after the lockdown compared with before. The rise in sexual habits may be attributable to participants' desire for intimacy and reassurance or simply spending more time with their partner<sup>[22]</sup>.

In the current study, FSFI showed significant negative correlations with age, children number, and age of youngest, and this agreed with Fuchs *et al.*<sup>[23]</sup>, who illustrated the cause of their result was that during a pandemic, the primary factor in the disintegration of romantic relationships is worry over the health of the couple's child. Intimacy and sexual relationship between spouses after the first childbirth were thought to play a significant role in the larger shift in FSFI scores in families with kids in comparison to those who are childless, according to Stavdal *et al.*<sup>[24]</sup>. The authors pointed out that babies frequently demand all of the parent's attention, resulting in reduced closeness and time for the parents. The initial viewpoint in the current study had a stronger correlation with COVID-19<sup>[24]</sup>.

Among all studied participants, depression score was assessed; 52.3% were normal, 5% had mild, 6% had moderate, 12% had severe, and 24.7% had extremely severe depression scores. In the current study, the mean depressive symptoms in the healthy group was 2.1, raised to a mean of 12.3 for previously infected women.

This was supported by several studies, such as one by Qiu *et al.*<sup>[25]</sup>. The authors found that during the early stages of the COVID-19 outbreak, 32.1% of respondents self-reported slight to severe emotional pain, 16.5% displayed moderate to severe depression symptoms, as well as 28.8% had average to severe anxiety<sup>[25]</sup>.

Among all studied participants, the anxiety score was assessed; accordingly, 40% were normal, 12.3% had mild, 4.7% had moderate, 3% had severe, and 40% had extremely severe anxiety scores. In the current study, the mean anxiety symptoms in the healthy group was 3, and raised to an average of 12.8 for previously infected women.

Yet, another study<sup>[26]</sup> found that during the earliest stages of the COVID-19 outbreak, 19.1% of the Iranian population sample experienced significant anxiety. As part of their weekly morbidity and mortality rates, the Centers for Disease Control and Prevention (CDC) surveyed 5470 adults aged 18 and up between June 24 and 30, 2020. CDC found that 40.9% of participants had experienced a psychological abnormality at some point in their lives; 30.9% acknowledged having anxiety and depression symptoms<sup>[27]</sup>.

Since the emergence of the COVID-19 pandemic, a study from South Korea on the mental well-being of over 1000 people, reported that 34.2% of participants suffered mild to severe depression, and 28.8% experienced light or higher anxiety levels<sup>[28]</sup>.

In the current study, the mean stress symptoms in the healthy group (1.9) were raised to a mean of 12.1 for previously infected women. In the present study, DASS showed significant positive correlations with age, education level, duration from infection or close contact, children number, and age of the youngest child. However, there is a significant negative correlation between DASS and FSFI ( $r = -0.84$ ,  $P < 0.001$ ) (the higher score of FSFI means good sexual function, but the higher score of DASS means bad psychological status).

This supports research by Liu *et al.*<sup>[29]</sup> investigating women's reproductive health following a significant earthquake in Asia in 2008. It was observed that a serious disaster causes widespread sexual dysfunction and poorer sexual life satisfaction. That might imply that the impact on sexual elements is harmful when the issue affects everyone nearby similarly and could have long-term effects.

In contradiction to another study, Hall *et al.*<sup>[30]</sup> investigated the impact of stress symptoms on the sexual health of 992 young women (aged 18–20 years). According to this study, sexual activity frequency and depression symptoms are positively correlated. Furthermore, it is likely that coping with stress is greatly influenced by one's age.

## CONCLUSION

The results of the study showed that COVID-19 adversely impacted the majority of women's levels of depression, anxiety, and stress, as well as every aspect of female sexual function and desire. Sexuality and psychological functioning are indicators that influence



one another, and COVID-19 increases these affections. Most women who survived COVID-19 were able to breathe normally again, but they could not regain their sexual capabilities fully.

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Ethical approval of the institutional review board and patient consents have been obtained.

The authors confirm that they will provide the fee for open access article publication as listed in the instructions authors.

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### CONFLICT OF INTEREST

There are no conflicts of interest.

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